

U.S. Bureau of Agricultural Economics
UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

cat #
AD 10
Add

ADAPTATION OF THE FARM CAPITAL STRUCTURE TO UNCERTAINTY*

By Donald C. Horton, Agricultural Economist

(A paper prepared for informal discussion in a seminar on uncertainty and uncertainty research at the University of Chicago, June 3 and 4, 1948)

INTRODUCTORY COMMENTS

Presumably one of our chief interests in uncertainty is in its conditioning influence on the structure and operations of the farm firm. It seems reasonable to expect that among the many adaptations of the farm firm to uncertainty would be included adaptations of its capital structure. A part of the adaptation might be expected to represent conscious efforts on the part of the entrepreneur to adjust the network of contractual relationships usually embraced under the term "capital structure" so that the firm combines reasonable survival prospects with reasonable prospects for efficiency of operations. A part of the adaptation, however, may represent merely the survival of those firms which have capital structures (and other economic characteristics) that are best adapted to the uncertainties of the business.

Because at present the field of uncertainty research is long on conjectural hypotheses and short on empirical verification, almost any empirical evidence is likely to be helpful. But it is difficult to measure variations in uncertainty, because uncertainty as a conduct conditioning influence falls in the same category as the other "real costs". Uncertainty can be measured indirectly, however, by (1) the use of the presumption that differences in measurable physical and economic phenomena introduce different degrees and kinds of uncertainty into the decision making of the entrepreneur, and (2) the use of the further presumption that differences in end results reflect adaptations to different degrees and kinds of uncertainty.

It seems probable, however, that in all such indirect approaches to the measurement of degrees of uncertainty, we unconsciously have in mind something like a "representative firm" as the standard of comparison. For that representative firm, one set of physical and economic conditions presumably causes more uncertainty than does another set of physical and economic conditions. Likewise, on the effect side, the fact that two firms are otherwise comparable permits interpretation of the more drastic adaptations by the one firm as a reflection of the effects of different degrees or kinds of uncertainty.

In a sense, therefore, we are forced to do empirical research on the extent and significance of uncertainty mainly through the use of data that reflect but that do not necessarily measure uncertainty. The data measure differences in either the causal or the effect aspects of the phenomenon. Such data are most useful to test conjectural hypotheses for conformity to facts. The illustrative data used in this paper obviously represent only first beginnings in a search for empirical evidence of differential adaptations of farm-capital structure patterns to presumptive differences in uncertainty.

1000
1000

NATURE OF THE DATA PRESENTED IN THIS PAPER

Specific data used in this paper are in part a by-product of another research project which studied mainly broad relationships between the financial organization of farms and their characteristics as capital-using entities. (BAE - National Bureau project). In that study each of 108 counties was used as a separate observation. Estimates were made for each county for 1940 to describe: (1) the size and asset structure of farms; (2) the nature and composition of the gross product; and (3) the capital structure pattern as measured by amounts and kinds of interests in the assets. Without going into details, the main point for this paper is that the data are estimates for entire counties for 1940. On no other basis is it possible at present to develop comprehensive data showing enough about capital structure patterns of farms to warrant analysis.

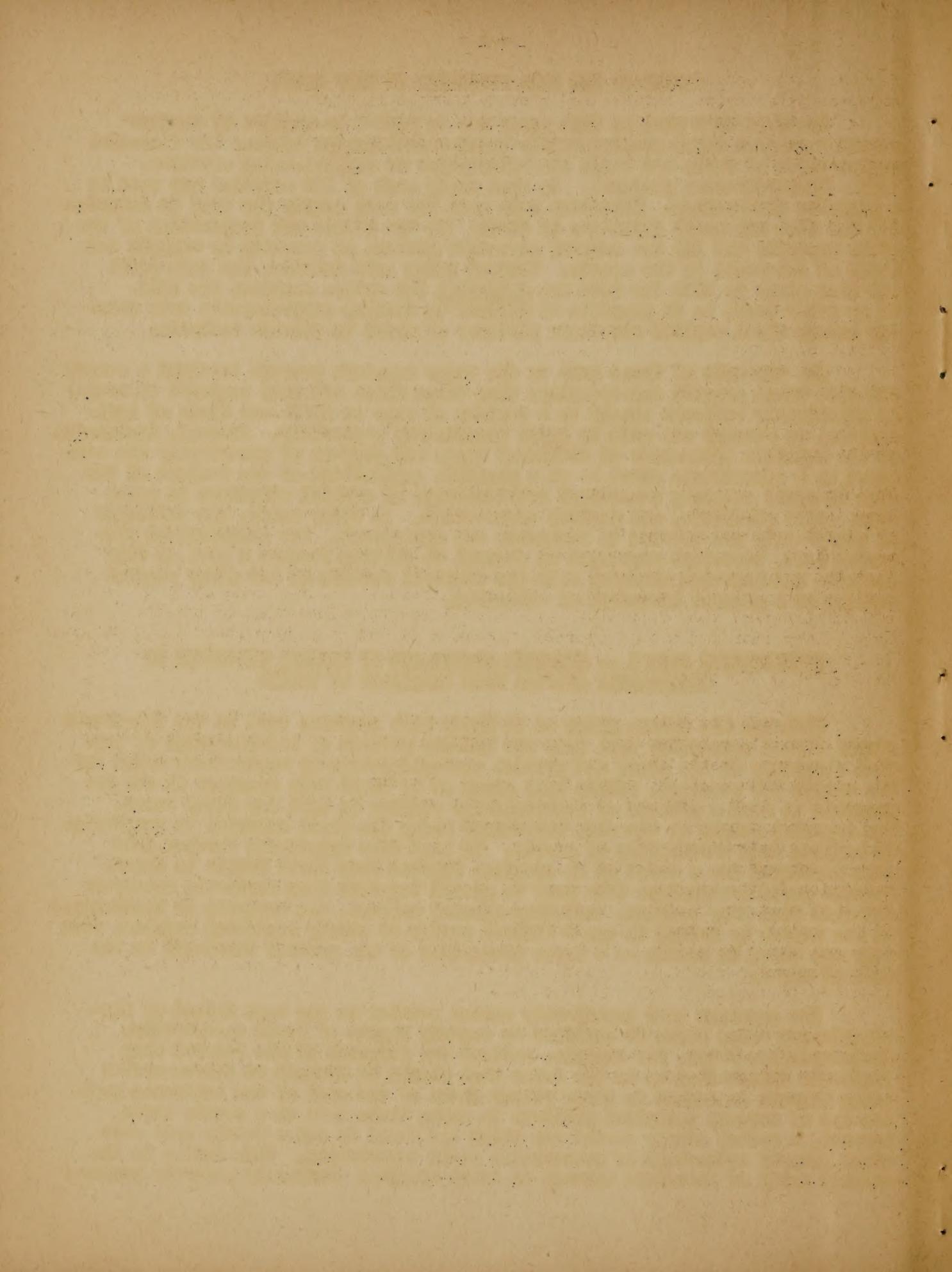
The use made of these data in the major research project involved a search for more basic general relationships than those which are only regional in scope. As uncertainty reflects itself in a variety of ways in different kinds of agriculture, no attempt was made to treat uncertainty separately. Instead, discussion of the separate influences of different kinds and degrees of uncertainty was confined to a subordinate place -- as a possible explanation of the failure of the data to yield entirely consistent relationships of capital structure to asset size, asset structure, and product composition. In other words, the influence of uncertainty was treated in footnotes and appendices. The illustrations presented here, therefore represent an attempt to develop further a part of this footnote and appendix material with the over-all results of the other project serving as a general framework of reference.

SEP 2 1948

ILLUSTRATIVE CASE 1 -- APPARENT ADAPTATION OF CAPITAL STRUCTURE TO UNCERTAINTY ARISING FROM VARIATION IN YIELDS

Although the entire group of 15 Wheat Belt counties used in the 108-county sample fitted reasonably well into the broader pattern of relationships of capital structure to the asset and product characteristics of agriculture found for the entire 108 counties, within this group of 15 Wheat Belt counties it was not possible to find a pattern of relationships similar to that for other areas. One apparent reason is the wide variations among the wheat counties in uncertainty arising from variability of yields. To test this hypothesis further, data were developed for a total of 24 counties located from North Dakota to Texas. Because capital-structure data must be pieced together from available materials obtained from many sources, including special surveys, the analysis is handicapped at the outset by having to use a limited number of widely separated counties with only one thing in common -- a large proportion of the product throw-off in the form of wheat.

The question that immediately arises relates to the best method of distinguishing among these 24 counties as regards degree of yield uncertainty. Crop-insurance rates, for example, reflect the judgment of the Federal Crop Insurance Corporation as to the rates that should be charged to differentiate among farmers in regard to their proper share of the cost of the insurance pool. Because of certain technical problems in using these data on a county basis, however, a rather simple device was tried and found to agree fairly well with other general indicators of presumptive yield variability. This device is the average ratio of harvested acreage to total cropland (excluding plowable pasture)



for the three Census years 1929, 1934, and 1939. No extravagant claims are made for this device, but for the present purpose it appeared to differentiate among the 24 counties well enough so that it would be reasonably safe to say that the 8 high counties as a group contained agriculture involving substantially more yield uncertainty than did the 8 low counties.

One difference in the three groups of counties is found in the extent of asset deflation in the thirties. Comparative data are shown below: 1/

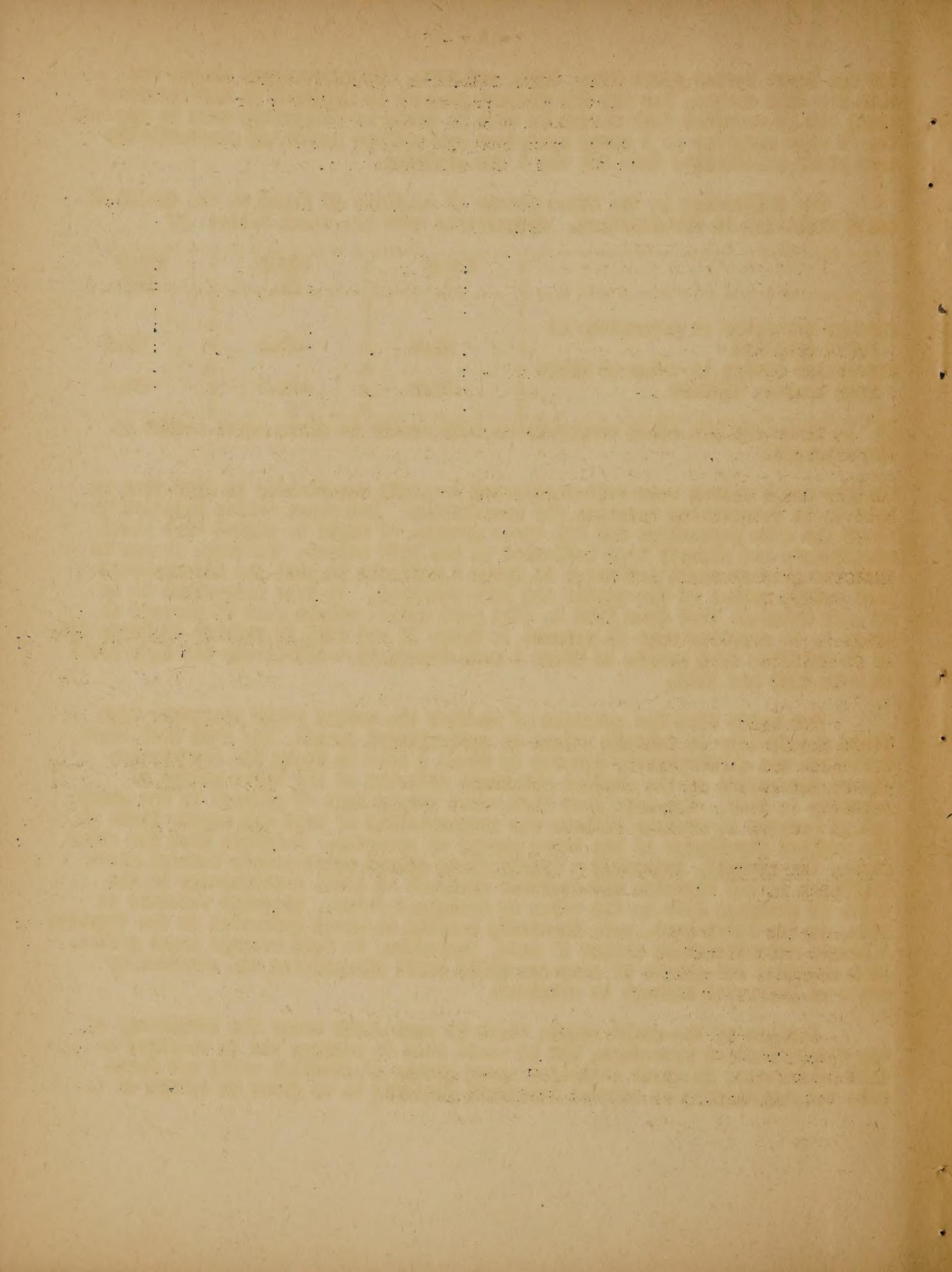
	Group I	Group II	Group III
Acreage harvested as percentage of total cropland	53.0	68.1	82.3
Percentage change in value of physical assets, 1930-40	-46.8	-43.6	-34.6

1/ In these and all other computations each county is given equal weight in the averages.

Whether asset values were better adjusted to yield uncertainty in 1930 than in 1940 is an interesting question for speculation. Had asset values declined by about the same percentage for all three groups, it might be argued that yield uncertainty had already been reflected in the 1930 values. However, it may be that the greater asset deflation in Group I reflects in part the disorganized real estate market of the middle and late thirties. In this connection it is of some interest that from 1940 to 1945 real estate values rose 63 percent in Group I, as compared with 56 percent in Group II and only 39 percent in Group III. It is possible that assets in Group I were valued at a relatively too high level in both 1930 and 1945.

But aside from the question of whether the market fully discounts high yield uncertainty in putting values on agricultural assets, the fact that asset deflation was substantially greater in Group I than in Group III complicates direct comparison of the capital structure patterns of the three groups of counties in 1940. The mere fact that asset values fell 47 percent in one group and 35 percent in another affects the comparability of debt and equity items in the capital structures of the three groups of counties. Evidence from the other study, for example, indicates a fairly clear direct relationship between asset deflation in the thirties and creditor interest in 1940, particularly in the ratio of mortgage debt to the value of mortgaged farms. Operator interest in 1940, on the other hand, were inversely related to asset deflation in the thirties. A simple stratification device is used, therefore, to hold average asset deflation constant for groups of counties while still classifying the counties by ratio of harvested acreage to cropland.

Because of the small sample there is some doubt about the efficiency of any stratification procedure, but it would seem to regroup the 24 counties so that differences in asset deflation among groups of counties would not dominate the comparisons of capital structure patterns to as great an extent as in



the unstratified sample. The results of this stratification procedure are shown below:

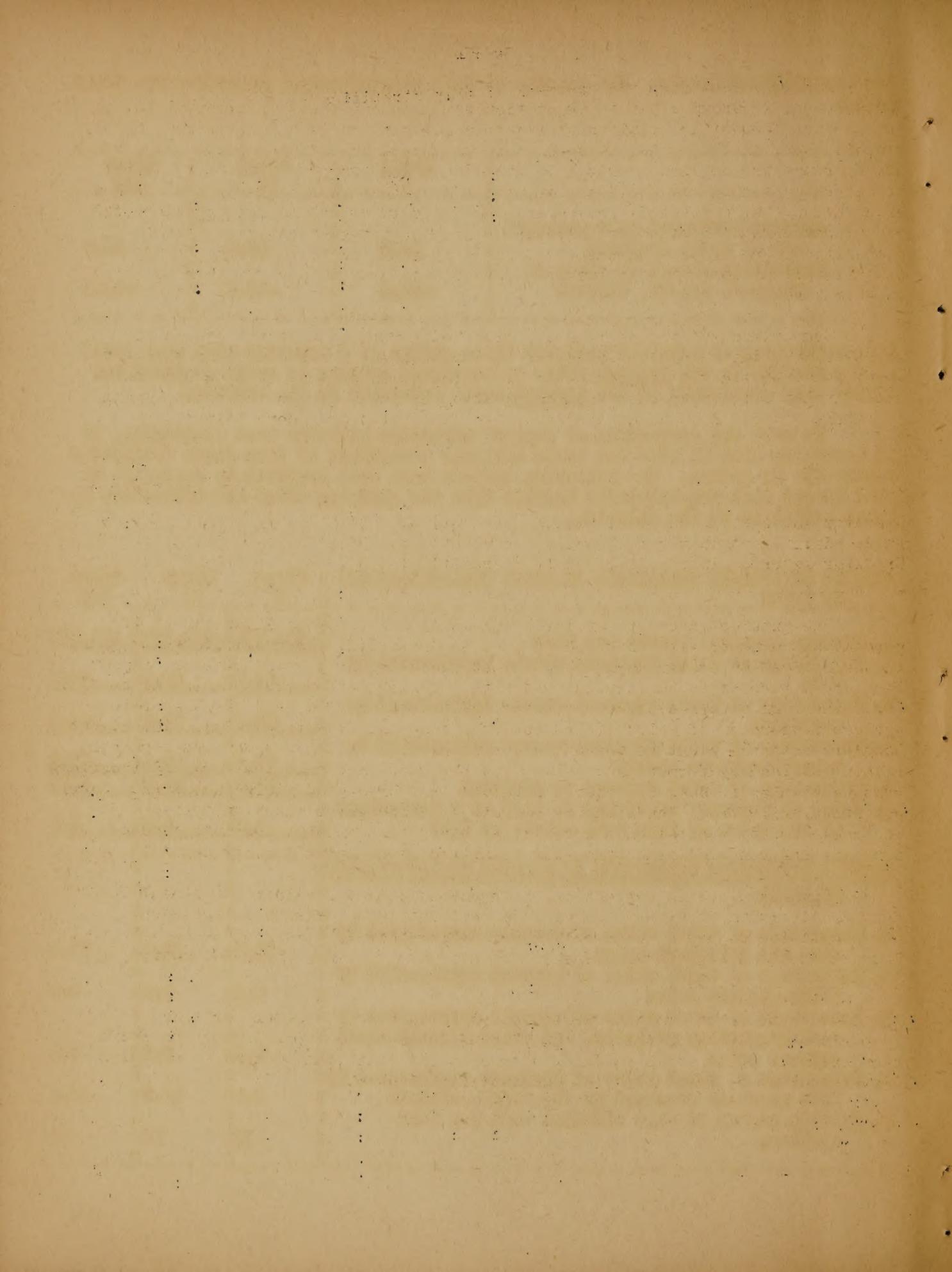
	Group I	Group II	Group III
Acreage harvested as a percent- age of total cropland	55.8	69.4	78.3
Percentage change in value of physical assets, 1930-40	-41.5	-40.0	-43.6

This regrouping of counties produces three groups of 8 counties each that still differ sharply in the average ratio of harvested acreage to total cropland but differ only moderately in the average asset deflation in the thirties.

To make the comparison of capital structure patterns most meaningful, it is desirable also to have the basic business structures of farm firms reasonably comparable by groups. The following indices have been computed to determine to what extent such comparability results from the grouping after stratification by asset deflation in the thirties.

INDICES REFLECTING VARIATIONS IN ASSET CHARACTERISTICS OF FARMS	Group I	Group II	Group III
1. Average physical assets per farm	\$12,724	\$12,200	\$10,743
2. Percentage of total physical assets represented by land	65.1	59.9	59.4
3. Percentage of total physical assets represented by buildings	12.9	15.9	15.1
4. Percentage of total physical assets represented by non-real-estate assets	22.0	24.2	25.5
5. Percentage of total acreage in cropland	57.4	65.6	57.1
6. Value of farmers' dwellings in 1930 as a percentage of the value of farm real estate in 1930	7.8	9.2	9.1

INDICES REFLECTING VARIATIONS IN PRODUCT CHARACTERISTICS OF FARMS			
1. Percentage of total value of product represented by crop and livestock sales	78.2	72.4	74.4
2. Percentage of total value of product represented by dairy-product sales	8.5	9.4	8.9
3. Percentage of total value of product represented by poultry, poultry products, and other miscellaneous product sales	4.3	7.2	6.6
4. Percentage of total value of products represented by farm products consumed by the farm household	9.0	11.0	10.1
5. Average number of days off-farm work per farm operator	33	21	23



Average asset size was somewhat larger in Group I than in Group III. Furthermore, in Group I asset composition ran somewhat more heavily to land, and product composition ran somewhat more heavily to crops and livestock (mainly crops). But, on the whole, it seems safe to assume that differences among the three groups are not great enough to invalidate general comparisons of capital structure patterns. It would appear, therefore, that we have here three groups of counties that are roughly comparable not only in regard to average financial experience in the thirties but also in regard to average asset size, asset composition, and product composition. This is about as close to the "representative firm" concept as it seems reasonable to expect to get with rough data of this kind.

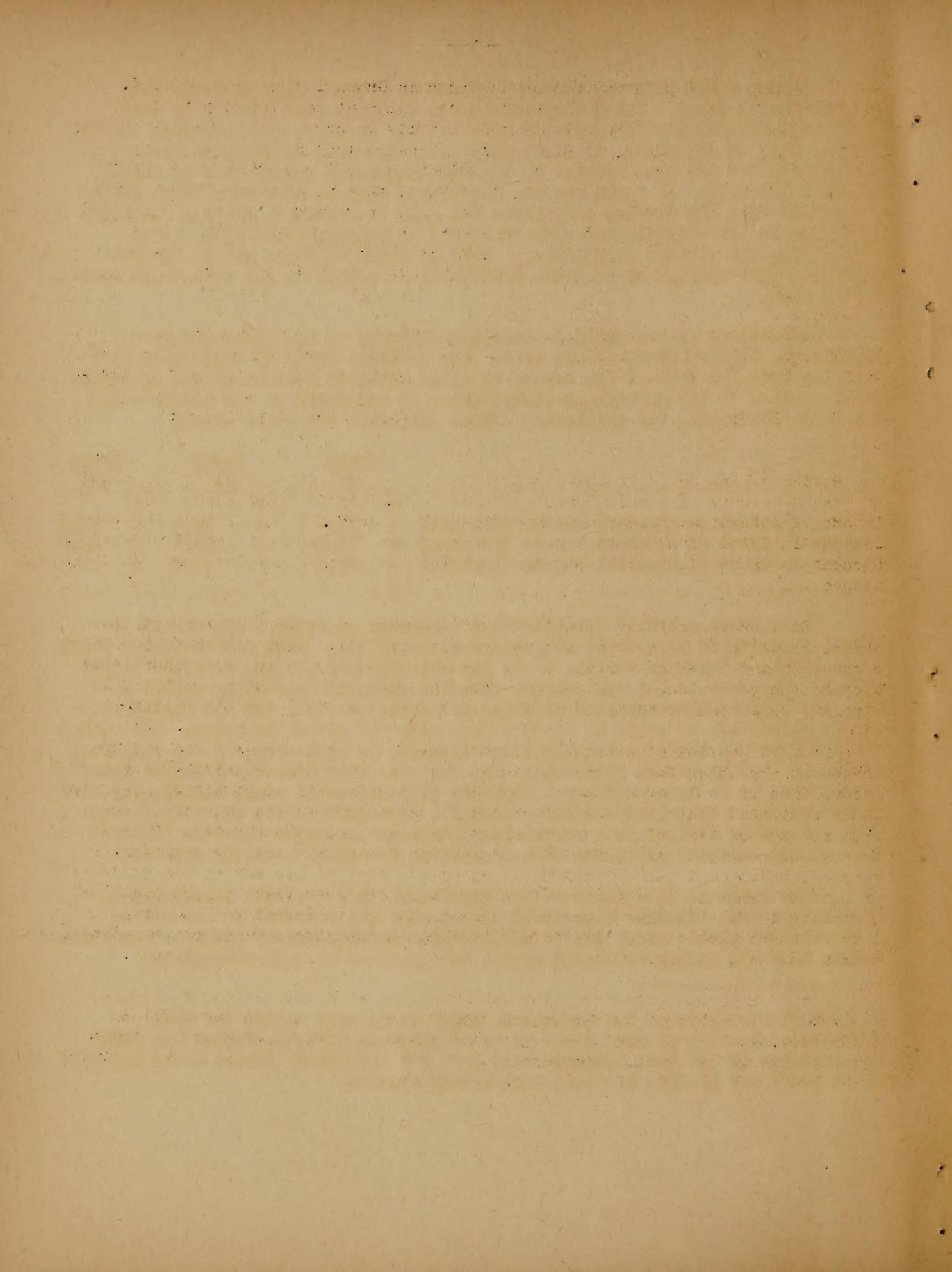
Comparisons of the capital structure patterns of the three groups of counties are limited by available data. The broadest basis of comparison that seems feasible (in view of the extent to which reliance must be placed on estimates) relates to the percentage distribution of interests in the assets among operators, landlords, and creditors. These estimates are shown below:

	Group I	Group II	Group III
Operator interest in physical assets (percent)	: 30.6	: 36.1	: 39.6
Landlord interest in physical assets (percent)	: 35.9	: 34.1	: 33.3
Creditor interest in physical assets (percent)	: 33.5	: 29.8	: 27.1

The outside interest (creditor and landlord) in Group I was almost 70 percent as compared with about 60 percent in Group III. From relationships found in the entire 108-county sample, it is not inconsistent to find somewhat higher landlord interests in the agriculture with the higher-than-average assets per farm, the higher-than-average percentage of assets in land, and the higher-than-average proportion of value of product from crop and livestock sales. The higher landlord interest might be accounted for in part, in this case, by the temporary holding of land by former creditors. But the mere fact that the landlord interest runs as high as it does in Group I suggests that area-wide yield uncertainty does not necessarily repel landlord investment.^{3/} Such agriculture may attract considerable equity capital on a speculative basis for somewhat the same reasons that mining ventures often are able to attract speculative equity capital.

Some evidence in support of the hypothesis that landlord investment in the counties with apparent high yield uncertainty was somewhat in the nature of speculative common stock can be adduced from certain Census tenure statistics. Because debt and equity relationship are not involved in such comparisons,

^{3/} 1940 is too close to the depression years to be most useful for this comparison. In view of this fact, it is of interest that Mr. Barber has found some evidence of the same tendency when data for individual Kansas farms for more recent years are grouped by yield variability classes.



the 24 counties are grouped below without stratification by asset deflation in the thirties:

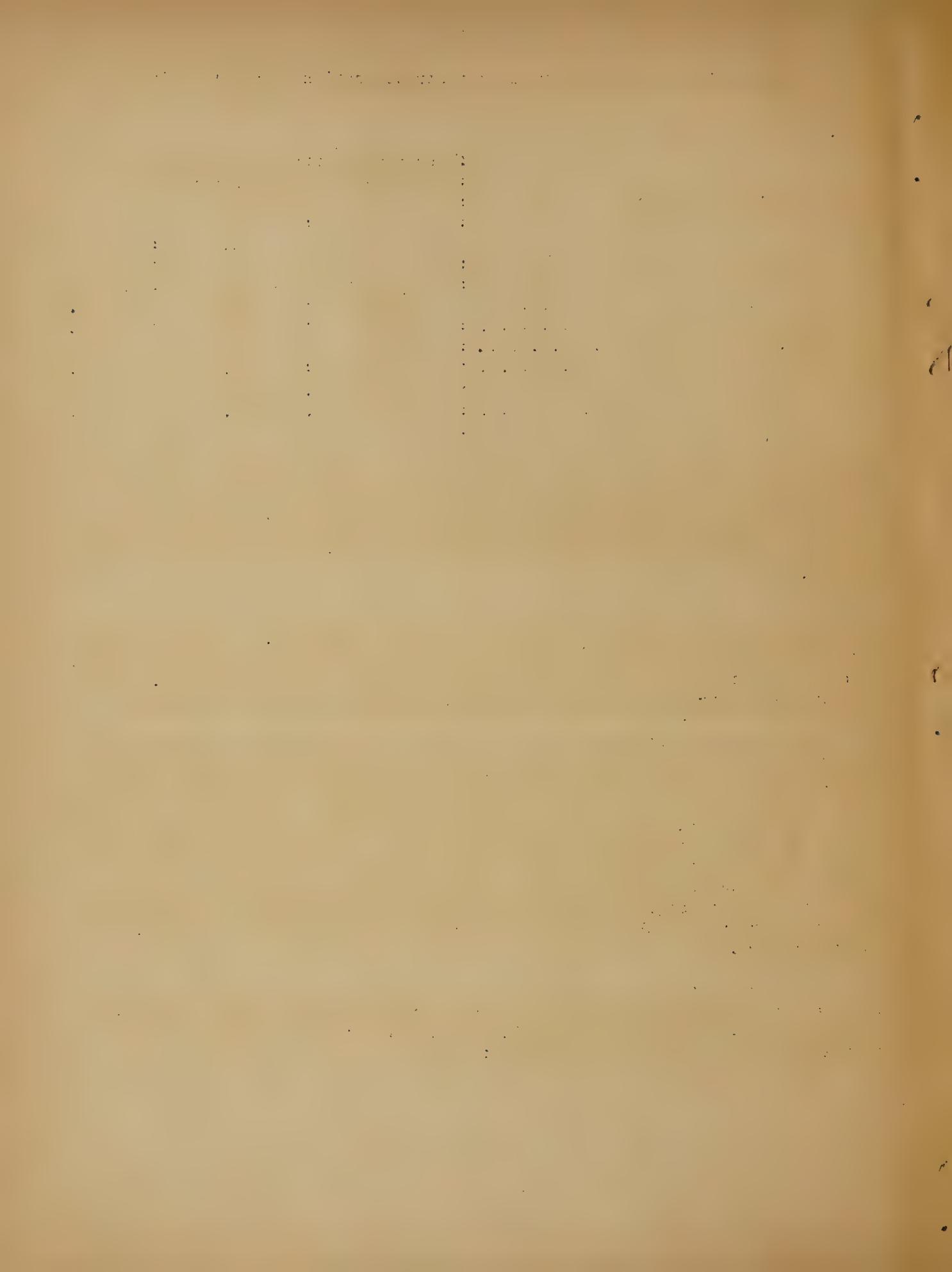
Method of rental	:Percentage distribution of value of real estate in tenant-operated farms in 1940		
	I	II	III
	Percent	Percent	Percent
1. Cash	5.6	7.4	9.8
2. Cash-share	18.8	34.0	39.4
3. Share	71.8	54.8	47.5
4. All other	3.8	3.8	3.3
Total	100.0	100.0	100.0

The most striking point in this tabulation is the high proportion of the value of tenant-operated farms in Group I represented by farms under share lease (about 72 percent as compared with 48 percent in Group III). In 1945 the percentage in farms under share lease in Group I was 73 percent as compared with 56 percent in Group III, which suggests that 1940 was not an abnormal year in this respect.

Data on the relative importance of the part-owner type of farm-business organization in these groups of counties also are revealing. In 1940 about 42 percent of the total farm real estate value in Group I was in part-owner farms, whereas the percentage in part-owner farms in Group III was 32 percent. This also may be a form of adaptation of capital structure to yield uncertainty.

If in capital structure we include the entire pattern of financial arrangements by which farm firms obtain and retain control over physical capital goods, then it would appear that there may be significant adaptations, along the lines indicated above, of capital structure to conform to the peculiar financing requirements of agriculture characterized by high yield uncertainty. This is not to say, of course, that "what is" necessarily is a sufficient, or even the best kind of, adjustment for agriculture. About all that we can say on the basis of present evidence is that apparently agriculture characterized by high yield uncertainty tends to attract considerable outside equity investment on terms that leave a major part of the uncertainty bearing on the shoulders of nonoperating equity holders.

We turn next to the creditor interest in more detail. Data bearing on the real estate credit picture in the three groups of counties are shown on following page. (The sample is again stratified for asset deflation in the thirties in the following comparisons):



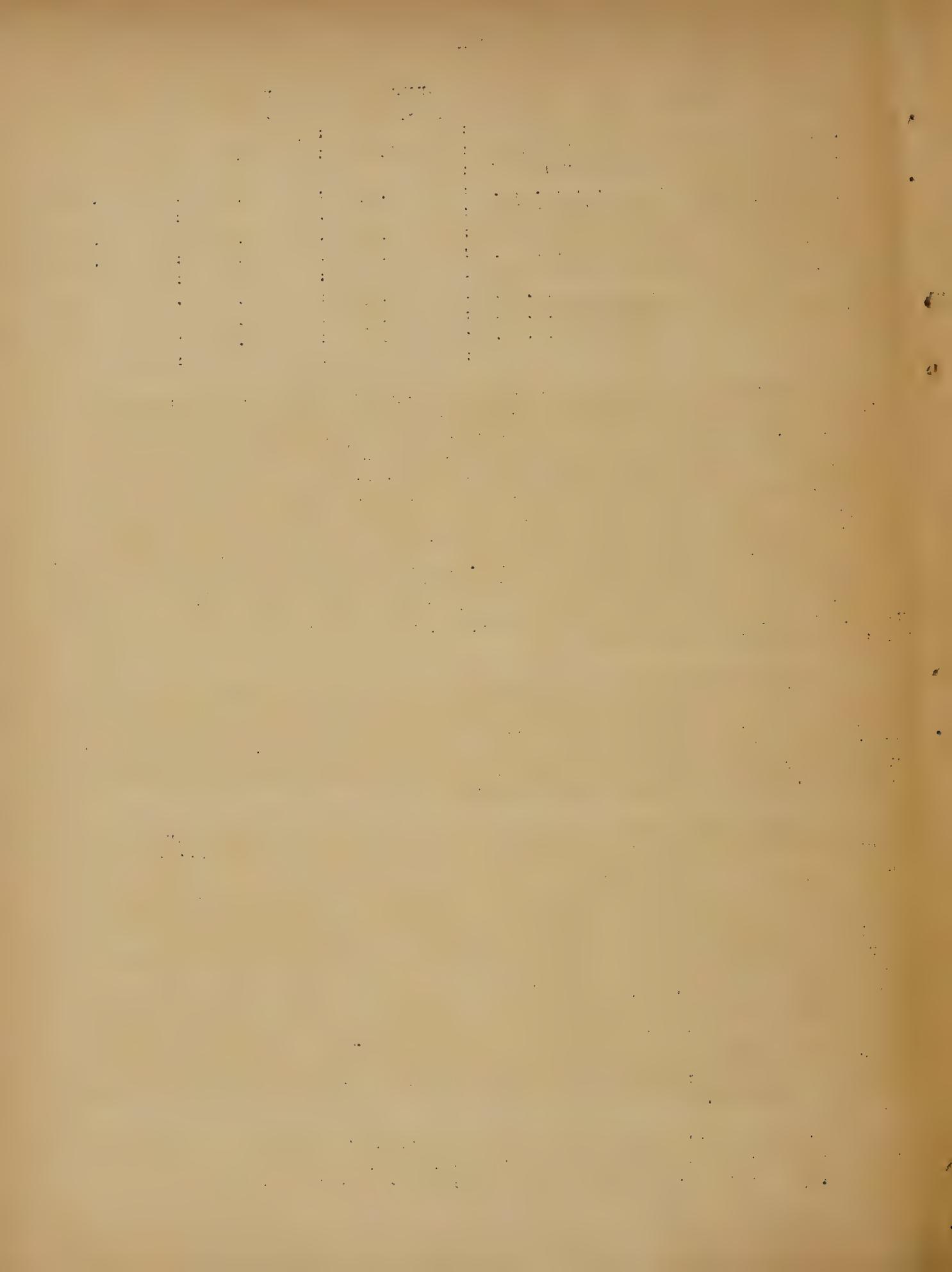
	Group I	Group II	Group III
Percentage of all farms under mortgage	55.9	51.6	48.8
Percentage mortgage debt of the value of mortgaged farms	49.3	50.2	47.5
Percentage mortgage loans of principal lender groups of total real estate assets	22.4	24.0	22.2
Federal land banks and FFMC	15.5	14.0	10.8
Insurance and mortgage investment companies	1.5	3.2	4.5
Commercial and savings banks	.5	1.2	.6
Individuals and others	4.9	5.6	6.3

A higher than average percentage of the farms in Group I had mortgage debts but the debt-to-value ratio in Group I was no higher than that for the entire group. The land banks and FFMC held a high proportion of the real estate loans in that group. This may reflect in part the overhang of the refinancing activities of the thirties, but it seems probable that some difference might be found also in other periods. Insurance companies apparently did not lend heavily in Group I despite the fact that for the entire sample of 108 counties agriculture with asset and product characteristics like those of Group I shows heavy participation by insurance companies. It seems reasonable to conclude that the greater yield uncertainty in Group I was the deciding factor for these lenders. Banks were an unimportant source of real estate credit in all three groups, and private individuals' loans were a lower percentage of real estate assets in Group I than in Group III.

One hypothesis suggested by the above data is that the agriculture in Group I attracted equity investment by nonoperating individuals somewhat better than it attracted mortgage loans by such individuals. It is possible that the mortgage contract does not provide enough added security (or reduced uncertainty) for the investor to cause investment to follow the debt-financing path rather than the path of outright equity investment.

If data should become available for 1950 to repeat the above estimates of mortgage-debt patterns, it would be of interest to see to what extent a long period of prosperity alters the relative positions of the different real estate credit sources. The 1940 figures doubtless are influenced by developments in the thirties. But the fact that all private lender groups were less important in Group I than in Group III suggests that the private mortgage contract as such is not so widely used to shift uncertainty bearing to other shoulders in that group of counties. It is possible that agriculture can involve so much uncertainty (or so much of a particular kind of uncertainty) that speculative equity investment by outsiders actually is better adapted to its financing than conventional private mortgage financing. The mortgage contract may be well adapted to the shifting of uncertainty bearing to other shoulders only within a certain range of uncertainty or only in connection with particular kinds of uncertainty.

Whereas real estate loans in Group I were about the same percentage of real estate assets as in Group III (about 22 percent), the non-real-estate loans of the four lender groups for which data are available were much higher



in relation to non-real-estate assets in Group I than in Group III (42 as compared with 22 percent). Comparative data are shown below:

	Group I	Group II	Group III
Percentage non-real-estate loans of principal lending institutions of non-real-estate assets	: 42.4	: 29.1	: 21.7
a. Banks and production credit associations	: 17.0	: 15.0	: 10.6
b. FSA and emergency crop and feed loans	: 25.4	: 14.1	: 11.1
	:	:	:

Non-real-estate loans of both types of lenders were high in relation to non-real-estate assets in Group I. Possibly fluctuating yields tend to result in more carry-over loans with the result that capital that should be regarded as long-term investment is furnished, nominally at least, on a short-term basis. At least, a good a priori case can be made for the proposition that in agriculture subject to great yield variability a substantial part of the annual production expense should be regarded as potentially long-term investment.^{4/}

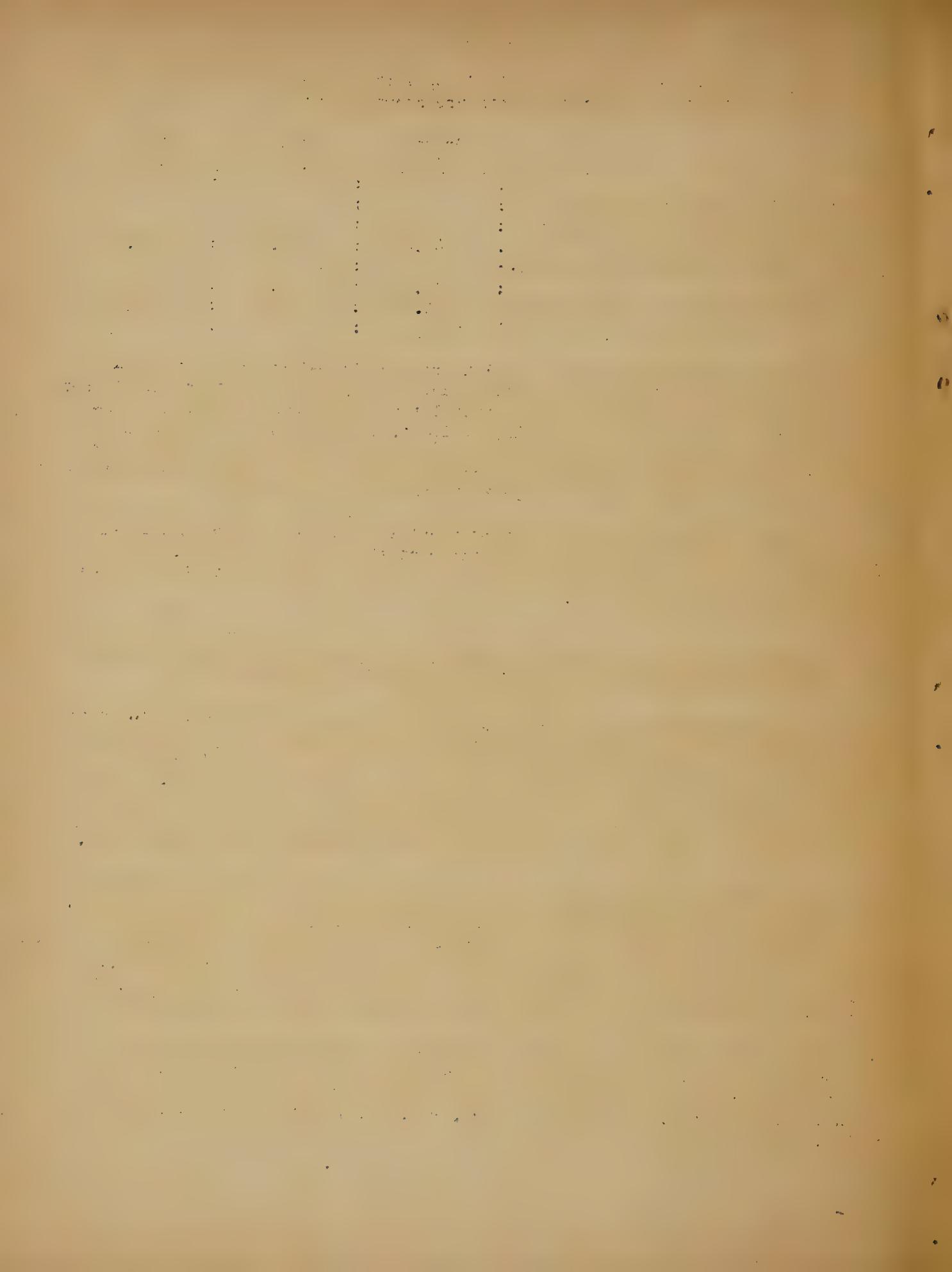
To avoid duplication, the apparent adaptations of capital structure to high yield uncertainty will not be summarized at this point. In fact, the distinctive types of adjustment stand out better when contrasted to those found in the second illustrative case.

ILLUSTRATIVE CASE 2 --APPARENT ADAPTATION OF CAPITAL STRUCTURE TO UNCERTAINTY ASSOCIATED WITH THE CRUCIAL IMPORTANCE OF MANAGEMENT IN FINANCIAL SUCCESS

In the analysis of the 108-county sample it became evident that so-called "high-risk" wheat counties often ran to high landlord and low operator interests, whereas apparently "low-risk" dairy counties often ran to high operator and real estate creditor interests and low landlord interests. This phenomenon suggested that a part of the causal connection between the latter type of agriculture and its capital structure pattern might be found in a kind of uncertainty situation that differs somewhat from ordinary yield uncertainty.

To study the effect on capital structure of uncertainty that may have its roots in a kind of agriculture in which management is of crucial importance, it is necessary to sort the counties to produce a particular "conjuncture" of internal economic characteristics of farms that will accentuate this causal factor. In the Wheat Belt comparisons, differences in capital structure were reflected mainly in the sources and terms of outside capital. Accordingly, for this second comparison it is necessary to have also a group of counties with

^{4/} This point is clearer if the firm maintained large financial reserves to tide over bad years. In bad years a substantial part of this fund would be invested in production and living expenses and in good years more of it would be in liquid reserves. The fund, as such, would be a part of the permanent capital of the business.



average asset size per farm high enough to require considerable outside capital. Hence, one item in sorting the counties should be average assets per farm. To bring into operation the influence of a type of agriculture in which management is likely to be of crucial importance, a sort of the counties according to proportion of value of product from dairy, poultry, poultry products, and miscellaneous sales is used. Finally, extensive participation of real estate creditors as a balancing factor in the capital structure appears to require among other things a high proportion of the acreage in cropland. A high index based on a combination of these three characteristics of the agriculture would seem to work in the direction of a capital structure pattern which uses a substantial amount of capital in addition to that of the operator but which attracts this outside capital rather heavily through the real estate loan channel rather than through landlord investment.^{5/}

For the present comparison, the entire 108-county sample is stratified by asset deflation in the thirties and then grouped into 12 groups of 9 counties each according to a "conjuncture index" based on asset size, percentage of acreage in cropland, and percentage of product from dairy, poultry, and related products. In this particular index, asset size and percentage of product from dairy, poultry, and related products are given weights of 1 each and percentage of acreage in cropland is given a weight of 2.6/. Thus a county could get into the top group of the array by a combination of the three indices. For tabular presentation, the top, middle, and low 18 counties according to this conjuncture index are used.

5/ No way was found to apply the "representative firm" concept in this comparison. Instead, the basic technique involves a unique grouping of counties that produces atypical relationships of capital-structure pattern to asset size and importance of cropland.

6/ The weighting probably is not crucial as only the kind of differences among groups rather than the extent of differences is involved.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

D

F

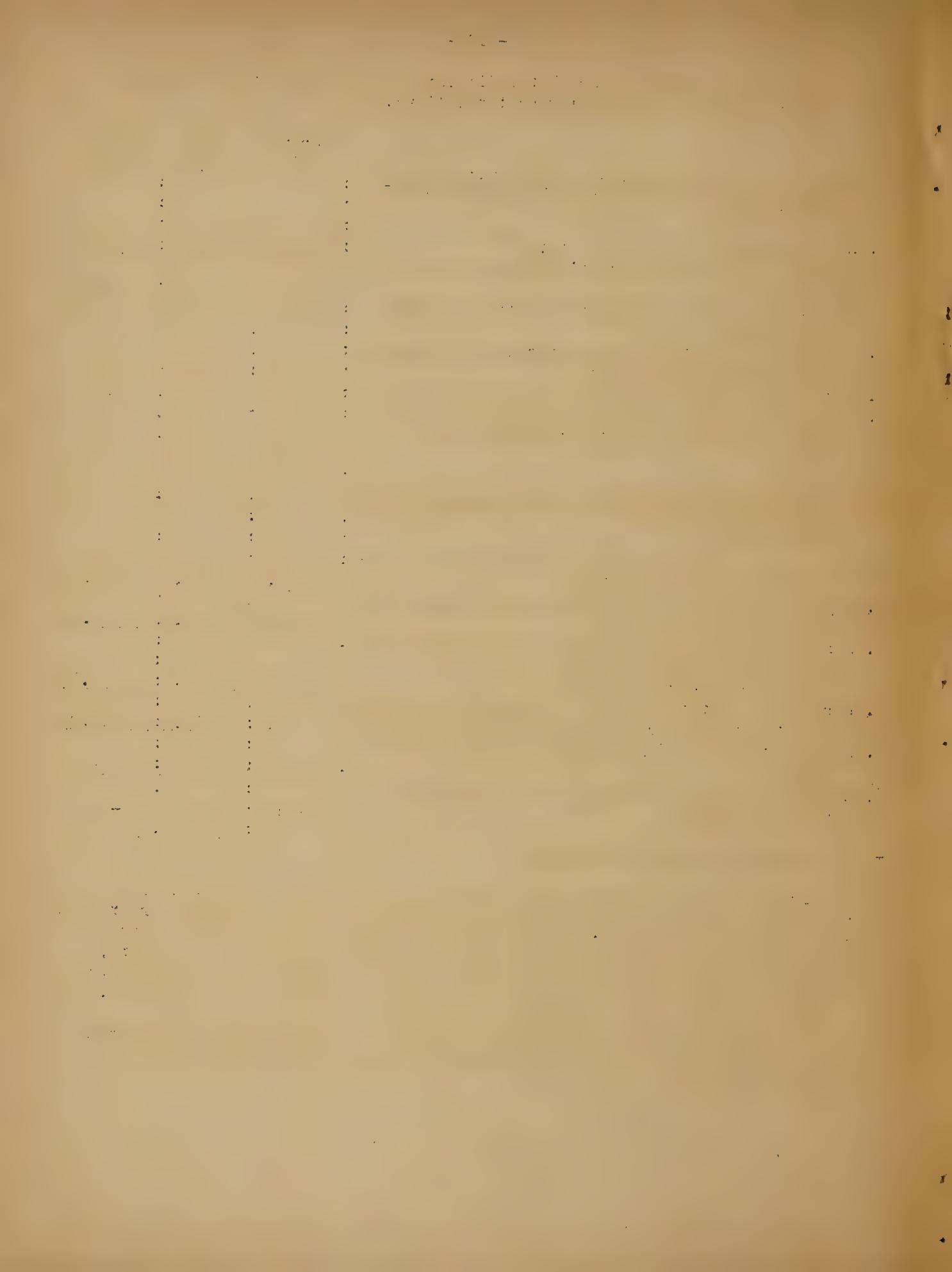
T

The kind of agriculture that falls into each of these three 18-county groups is suggested by the following tabulations:

	Group I	Group II	Group III
<u>INDICES REFLECTING VARIATIONS IN ASSET CHARACTERISTICS OF FARMS</u>	:	:	:
1. Average physical assets per farm*	:\$12,549	\$8,319	\$5,871
2. Percentage of total physical assets represented by land	49	53	54
3. Percentage of total physical assets represented by buildings	26	22	19
4. Percentage of total physical assets represented by non-real-estate assets	25	25	27
5. Percentage of total acreage in cropland*	62	40	17
6. Value of farmers' dwellings in 1930 as a percentage of the value of farm real estate in 1930	16	16	16
<u>INDICES REFLECTING VARIATIONS IN PRODUCT CHARACTERISTICS OF FARMS</u>	:	:	:
1. Percentage of total value of product represented by crop and livestock sales	62.7	62.9	68.1
2. Percentage of total value of product represented by dairy-product sales*	18.5	15.7	4.3
3. Percentage of total value of product represented by poultry, poultry products, and other miscellaneous-product sales*	8.3	5.7	2.4
4. Percentage of total value of product represented by farm products consumed by the farm household	10.5	15.7	25.2
5. Average number of days off-farm work per farm operator	28	32	43
6. Average percentage change in value of physical assets, 1930-40	-21	-22	-22

* Items used in grouping counties.

Probably the best short description of the counties in Group I of the above tabulation is that they represent counties with farms that are larger than average in asset size, farms engaged heavily in crop production, and farms in which crops are marketed to a considerable extent through the sale of dairy, poultry, and related products. Of course, mechanical grouping of counties would be expected to pick up some borderline cases that don't fit this description. Furthermore, there is some averaging of extremes. Nevertheless, the "conjuncture" index probably is efficient enough as a selector to warrant some conclusions regarding the kind of adaptations found in the capital structure of these 18 counties.

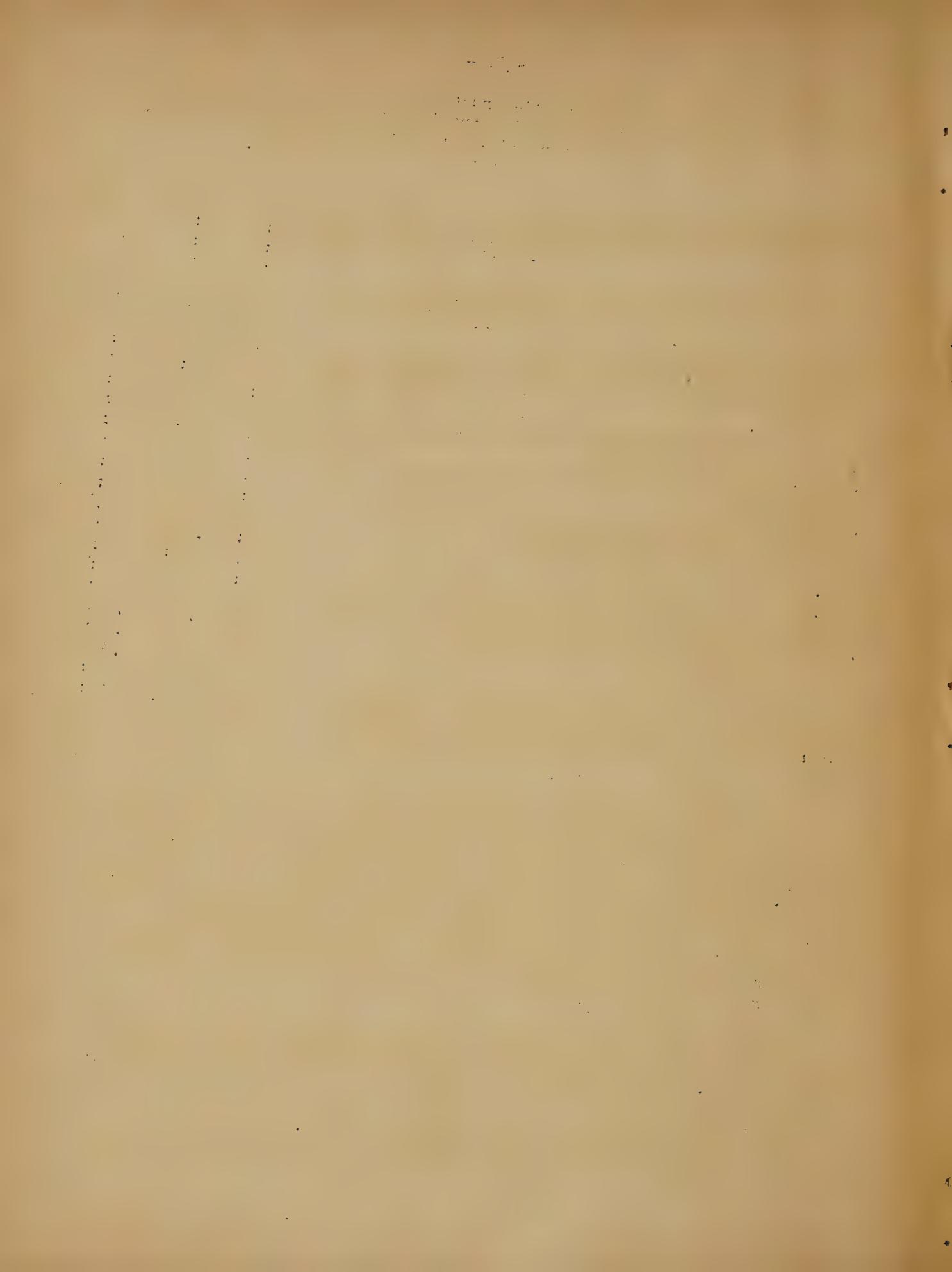


Interpretation of the capital-structure indices shown below for the three 18-county groups must be made in part in terms of general patterns of relationships found when the entire 108-county sample is independently grouped according to selected indices of the nature of the agriculture:

	Group I	Group II	Group III
<u>INDICES REFLECTING VARIATIONS IN THE FINANCIAL ORGANIZATION OF FARMS</u>	:	:	:
Operator interest in real estate assets (percent)	: 46	: 48	: 48
Landlord interest in real estate assets (percent)	: 32	: 32	: 36
Percentage of farms under mortgage	: 49	: 46	: 36
Percentage mortgage debt of the value of mortgaged farms	: 43	: 41	: 35
Percentage mortgage debt of the value of all farm real estate	: 22	: 20	: 16
Percentage farm-mortgage debt held by selected lenders of total real estate assets:	:	:	:
a. Federal land banks and Federal Farm Mortgage Corporation	: 9.3	: 9.6	: 8.1
b. Insurance and mortgage-investment companies	: 3.9	: 2.8	: .7
c. Commercial and savings banks	: 1.9	: 1.7	: 1.8
d. Individuals and miscellaneous lenders	: 6.7	: 5.7	: 5.1
Percentage non-real-estate loans of principal lending institutions of non-real-estate assets	: 14.6	: 22.2	: 22.6
a. Banks and production-credit associations	: 10.1	: 13.3	: 13.3
b. FSA and emergency crop and feed loans	: 4.5	: 8.9	: 9.3
Operator interest in total physical assets (percent)	: 50	: 46	: 47
Landlord interest in total physical assets (percent)	: 28	: 29	: 31
Creditor interest in total physical assets (percent)	: 22	: 25	: 22

The typical pattern, for example, would show operator interests that vary inversely with asset size and landlord interests that vary directly with asset size. Here operator interests remain a fairly constant percentage despite higher asset size, and landlord interests show a tendency to vary inversely rather than directly with asset size. The need for larger assets per firm is met in part by the operator furnishing the same or a higher percentage of the larger amount of required capital and by real estate creditors furnishing a higher percentage of the real estate capital. Landlords provide a smaller percentage of the capital in these large farm counties than in the smaller farm counties in Groups II and III.

The uncertainty factor in Group I would not seem to be area-wide yield uncertainty. It seems probable that the uncertainty that repels landlord investment, despite the presence of some factors that usually are associated with high landlord investment, is to be found in a combination of the nature of the assets and the kind of farming operations. With 50 percent of the assets in buildings and non-real-estate assets and with 25 percent of the product from dairy, poultry and related products, it is possible that equity



investment without direct control over assets and farming operations involves considerable uncertainty for the outside equity investor. A part of the adaptation is made by the operator furnishing more capital per farm. A part is made by outside investors using the mortgage contract to put more of the uncertainty-bearing function on the shoulders of the real estate owner. The mortgage contract appears to take out enough of the uncertainty so that even real estate loans by impersonal lenders such as insurance companies are an important source of real estate capital. "Individuals" apparently invest relatively more heavily as mortgage lenders and relatively less heavily as nonoperating equity investors in Group I than in the other two groups of counties.

A part of the heavier real estate credit financing in Group I may reflect also the use of real estate credit to finance general farm assets. This is suggested by the fact that non-real-estate loans of the four lender groups in Group I were only 14.6 percent of non-real-estate assets as compared with 22.6 percent in Group III. A number of other hypotheses also are suggested by these data, but the foregoing discussion is perhaps sufficient to indicate the techniques used and the types of results that are obtained by this method of analysis.

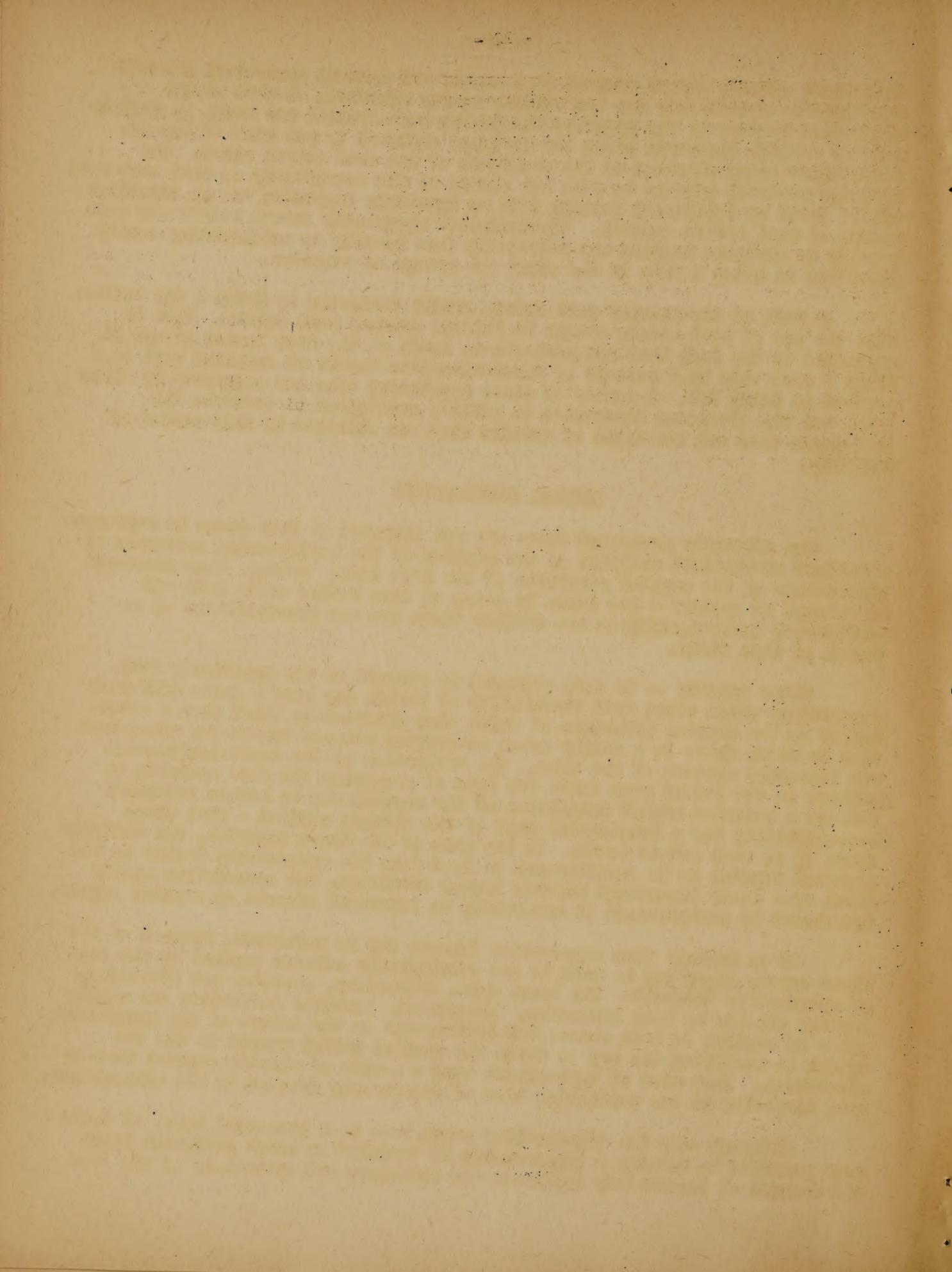
GENERAL OBSERVATIONS

The materials presented above are not intended at this stage to represent a refined statistical analysis of the problem of the conditioning influence of uncertainty on the capital structure of the farm firm. Rather, they represent an attempt to explore a few ideas by means of some rather crude data and statistical devices, mainly to see whether there are any possibilities of research in this field.

There appears to be some evidence in support of the hypothesis that uncertainty which stems from variability of yields may have a quite different impact on the capital structure of farms than uncertainty which from a situation in which there is a fairly close connection between day-to-day management and financial success of the firm. The adaptation of the capital-structure pattern in the latter case takes the form of requiring the farm operator to furnish a somewhat higher proportion of the capital and to assume financial responsibility for a substantial part of the outside capital - that which flows in as real estate loans. In the case of the Wheat counties, the mortgage contract appears to be insufficient to tone down the uncertainty factor to the level that meets impersonal private lender standards, but speculative equity investment by nonoperators is apparently an important element in capital supply.

If an analogy from corporation finance may be permitted, Group I of the Wheat county group may be said to get considerable outside capital by the sale of speculative "common". The large farm, dairy-crop, counties get additional capital chiefly by bond financing. Uncertainty probably influences the supply price of capital in both cases, but differences in the nature of the uncertainty appear to condition the way in which the capital market reacts to the two situations. Each kind of agriculture taps a source of outside capital that is most adaptable to the particular kind of uncertainty present in the agriculture.

Although only two illustrative cases have been presented here, it would seem possible to develop a large number of "models" in which different kinds and degrees of uncertainty influence the structure and operations of the farm



firm. For example, low-income agriculture may present its own distinctive uncertainty characteristics. Agriculture that depends heavily on cyclically unstable markets may be another case. Agriculture that is beset by particular seasonal marketing problems may present a somewhat different case. Study of adaptations of capital-structure patterns may not only throw light on questions of adaptations of capital supply to uncertainty; it in turn may throw light on the broader significance of uncertainty for different kinds of agriculture.

Capital-structure adaptation is only one of many types of indicators by which the significance of different kinds and degrees of uncertainty may be observed. It seems probable that even more significant differences may be found in other features of the business structures of farms that are subject to different kind and degrees of uncertainty. If we could somehow set up our research in this field so that the results of research in different kinds of adaptations could be "additive", it might be possible over a period of time to develop a substantial fund of empirical evidence bearing on the significance of uncertainty for agriculture. To do this, however, requires a framework of reference within which the several kinds of empirical evidence can be made to add up to something more than a mere summation of the parts.

